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ANNUAL REPORT

TRAFFIC ENGINEERING BRANCH

DIVISION OF HIGHWAYS
DEPARTMENT OF TRANSPORTATION

75

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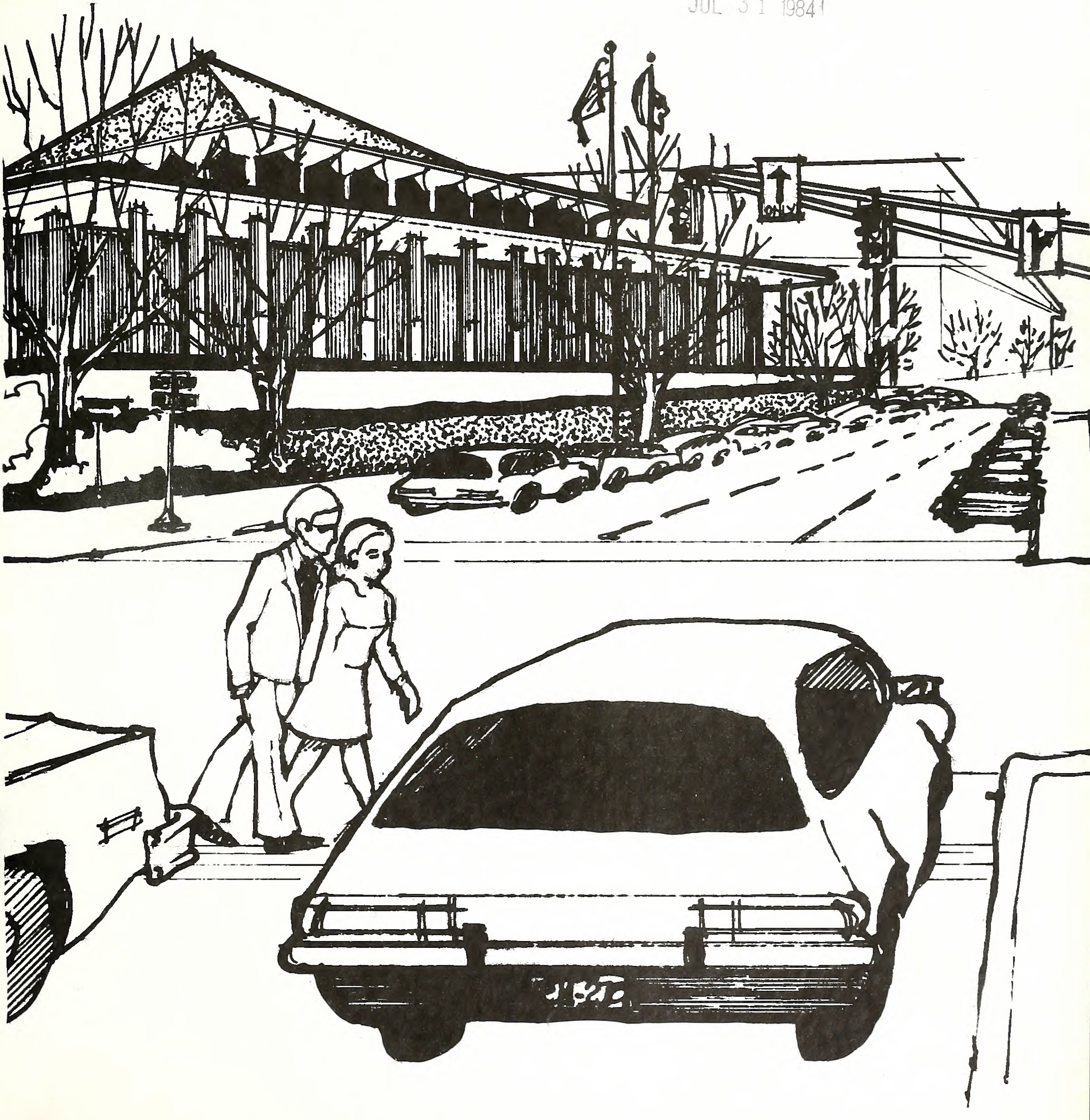

ANNUAL REPORT

TRAFFIC ENGINEERING BRANCH

1975

DIVISION OF HIGHWAYS
DEPARTMENT OF TRANSPORTATION

H. C. RHUDY MANAGER OF TRAFFIC ENGINEERING
PREPARED BY: SPECIAL PROJECTS UNIT

MARCH, 1976

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ACKNOWLEDGEMENTS

The close working relationship between the Traffic Engineering Branch and other Branches in the Division of Highways makes it difficult, within the confines of this text, to acknowledge all the members of the Highway "family" who have contributed to Traffic Engineering efforts of 1975 and other years, but we wish to express our gratitude for their assistance.

We would like to take this opportunity to recognize the cooperation and support of agencies outside the Division of Highways who have helped to make the accomplishments of the Traffic Engineering Branch possible. Some of these are: the Federal Highway Administration; the Governor's Highway Safety Program; the Division of Motor Vehicles, particularly the Highway Patrol Division and the Traffic Records and Information Division; the Highway Safety Research Center, UNC-Chapel Hill; and North Carolina State University.

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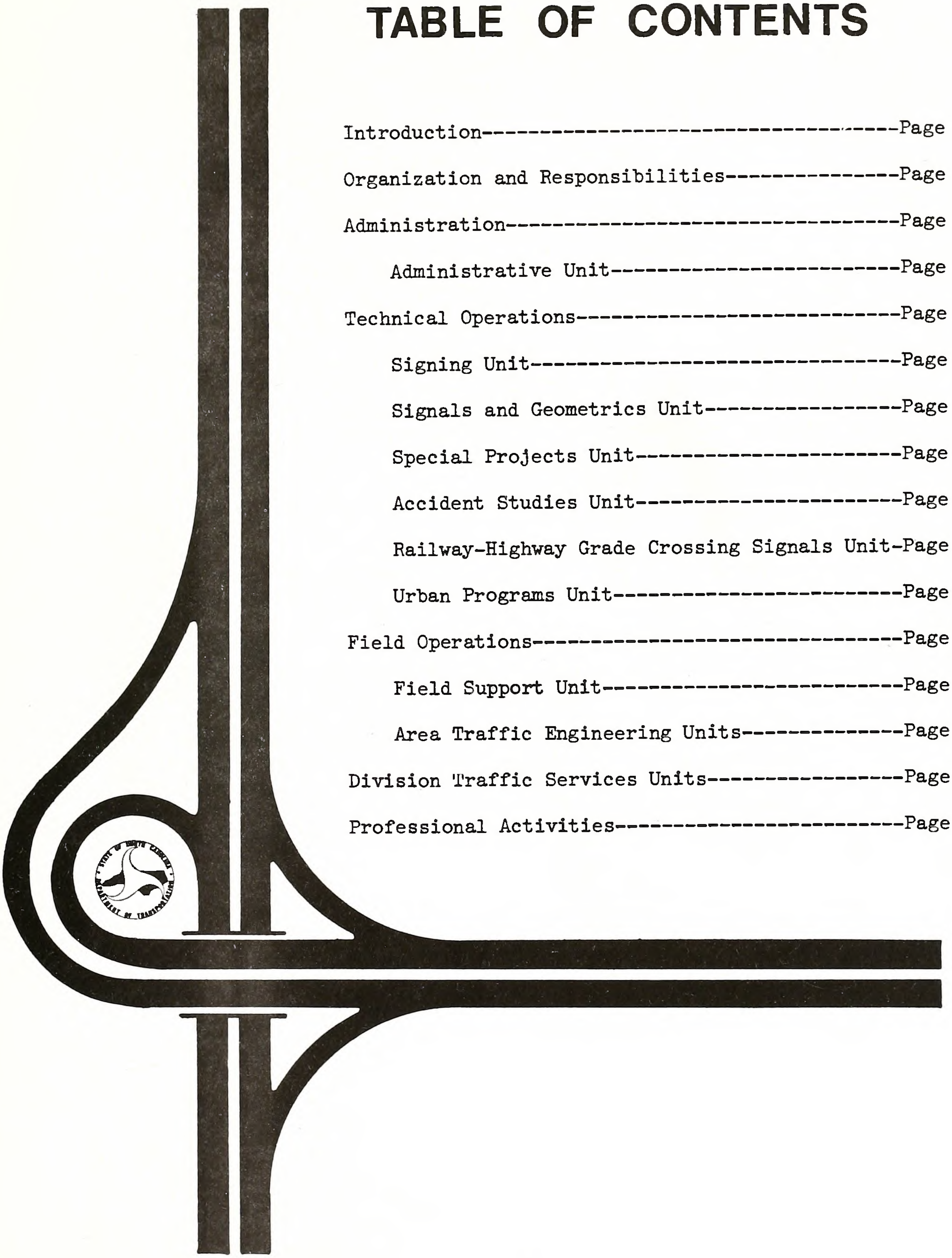


INTRODUCTION

The Traffic Engineering Branch's accomplishments for 1975 emphasize the diversity of work required in meeting responsibilities to the Division of Highways and to all who use State road facilities.

Work performed by the branch in 1975 is presented according to the several Units, with Professional Activities listed alone. Activities of the Division Traffic Services Units, whose work is so closely tied with the Traffic Engineering Branch, are reported under a separate heading. Activities for the year are enumerated wherever practical. Such figures, however, often represent only the results of extensive preparation and ground work, factors not easily stated in terms of quantity.

The Annual Report, as presented within the framework of Branch organization and responsibilities, is intended to serve two purposes:

1. To furnish Division of Highways officials and other interested persons with factual information on the annual work of the Traffic Engineering Branch.

2. To make knowledgeable the function of this branch within the structure of the Division of Highways -- to trainees, to college students, and to various groups concerned with the safe and efficient control of traffic on the streets and highways of North Carolina.

ORGANIZATION & RESPONSIBILITIES

The Traffic Engineering Branch is staffed to the Chief of Planning of the Division of Highways.

Essentially, the Branch is responsible for the safe and efficient traffic operations on the State Highway System--a system that consists of 11,868 miles of Interstate and rural primary US and NC numbered routes; 59,115 miles of rural secondary routes; and 3,924 miles of highway system routes within municipalities, for a total of 74,907 miles.

Some of the specific duties of the Branch are as follows:

1. To develop policies for the use of pavement marking, signing, signalization, channelization, driveway and street entrances, median crossovers, speed zones, highway routing, and parking regulations on the State Highway System.

2. To make continuous analyses of accident severity, types of accidents, locations with high accident frequency, and other significant studies leading to soundly conceived recommendations for improvements that are designed to reduce accident experience or severity, relieve congestion, and increase safety and efficiency of the State Highway System.

3. To develop and implement various traffic safety programs for the North Carolina State Department of Transportation, including Federal Highway Safety Programs and Projects as they are applicable to North Carolina. Under this responsibility, the branch developed, updates, and is implementing the Department of Transportation's North Carolina Highway Safety Program.

4. To administer the TOPICS program in North Carolina for the Department of Transportation.

5. To work closely with the 14 Division Traffic Services Units - setting policies and standards for work they perform.

6. To investigate requests, complaints, and suggestions for traffic operational improvements submitted to the Division of Highways by individuals, groups of citizens, public officials, and the Division's own personnel.

7. To provide technical advice and assistance to municipal officials and local governing bodies, upon their request.

8. To manage funds allocated for the historical marker program on State roads in cooperation with the Department of Archives and History, which is the State agency that requests these markers and submits appropriate legends for them.

There are 107 positions in the Traffic Engineering Branch as shown on the organization chart on page 7: 60 traffic engineers, 35 engineering technicians, 3 traffic control technicians, 6 clerk typists, 1 typist, 1 clerk stenographer, and 1 secretary.

The Traffic Engineering Branch is organized into two major functions: Field Operations and Technical Operations, each headed by an Assistant Manager of Traffic Engineering; staffed directly to the Manager of Traffic Engineering. This division of the organization is designed to provide a responsive decentralized field traffic engineering force with traffic engineers located geographically close to the traffic problems, an efficient centralized technical policy-making and design organization based in Raleigh to support the field forces, and a group of personnel to perform day-to-day tasks which are necessary for the mangerial functions of the branch. These functional groupings are further subdivided as shown below:

ADMINISTRATION

Administrative Unit

TECHNICAL OPERATIONS

Special Projects Unit
Signing Unit
Signals and Geometrics Unit
Accident Studies Unit
Urban Programs Unit
Railway-Highway Grade Crossing Signals Unit

FIELD OPERATIONS

Field Support Unit
Area Traffic Engineering Units (5)

The Administrative Unit is staffed directly to the Manager of Traffic Engineering and includes a stenographic clerical pool which serves the entire Branch. This unit also handles all personnel records, financial records, and equipment and supply needs.

Also staffed directly to the Manager of Traffic Engineering are one engineer and one technician to perform a variety of administrative staff functions for the Manager.

The TECHNICAL OPERATIONS UNITS are staffed to the Assistant Manager of Traffic Engineering (Technical Operations), and provide a central design and technical policy-making function which provides final plans for construction of the improvements and promotes uniform traffic engineering practices and quality control statewide. Technical Operations is subdivided into six units as follows:

The SPECIAL PROJECTS UNIT performs various special engineering projects. This unit conducts evaluation projects on traffic control devices, maintains the Branch technical library, coordinates technical meetings and training activities, and publishes Branch technical materials, as well as this report. The Unit also provides a variety of administrative staff functions.

The SIGNING UNIT handles all design work concerning signing and sign lighting on all state system streets and highways. The unit also prepares specifications and plans for sign lighting projects and processes requisitions for all signs and sign materials throughout the State.

The SIGNALS AND GEOMETRICS UNIT currently handles all major design work for the Branch in their respective technical area. In addition, the Signals and Geometrics Unit reviews roadway plans produced by the Highway Design Branch in the preliminary and advanced stages of design, recommends improvements as needed to provide the safest feasible facility, and reviews driveway permits.

The ACCIDENT STUDIES UNIT maintains constant surveillance of the entire State road system through a computerized accident data system and identifies accident problems as they occur. This unit produces an annual North Carolina Highway Safety Program Listing. Field Operations investigates the locations on these programs and makes recommendations for corrective action.

The URBAN PROGRAMS UNIT coordinates municipal TOPICS programs with the Federal Highway Administration, the Division of Highways, and the various municipalities, and is actively working on urban traffic problem areas not funded by TOPICS.

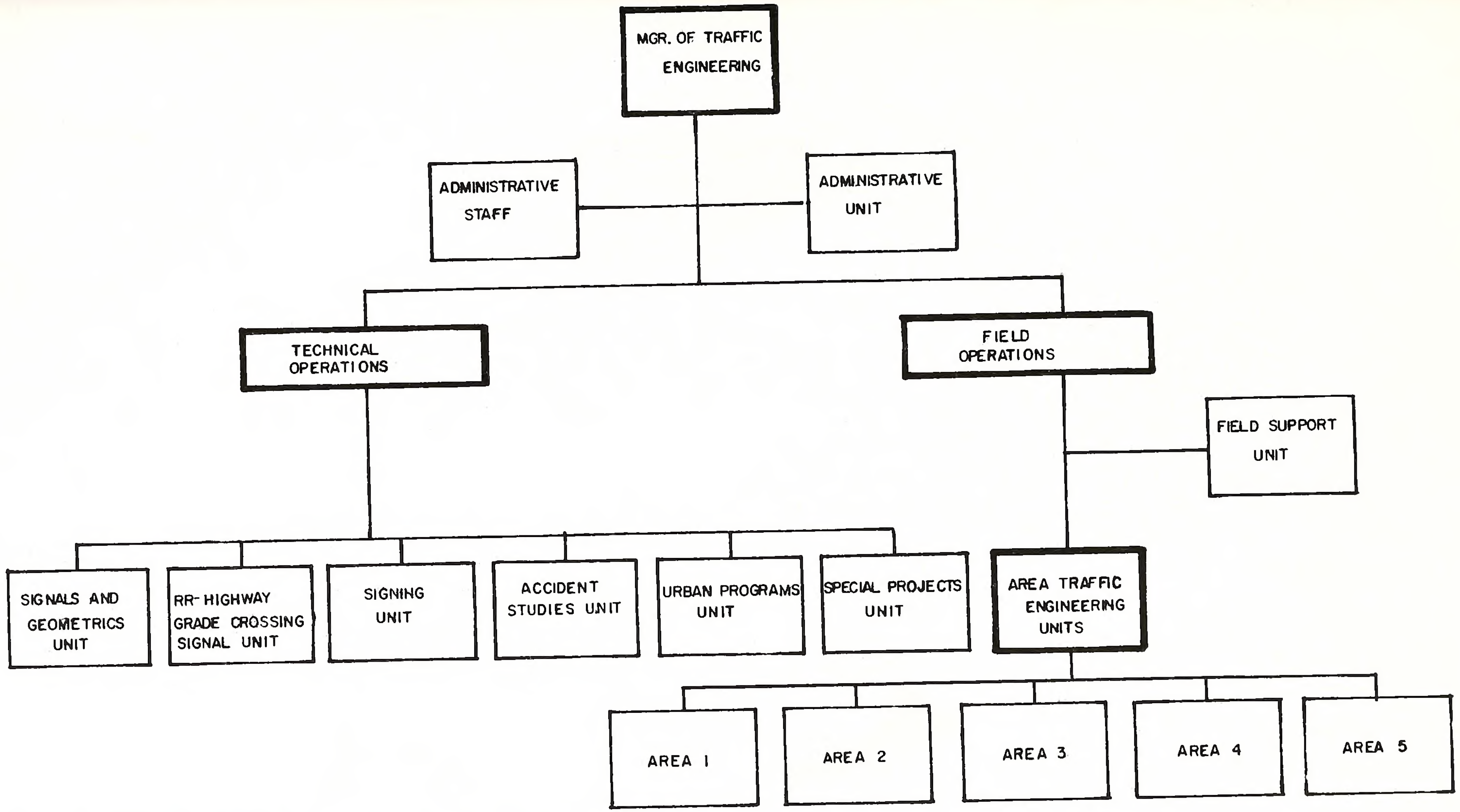
This Unit, working in cooperation with the Signals and Geometrics Unit, various municipalities, and consultants, provides assistance to the Construction Unit for those projects dealing with certain sophisticated traffic signal control. Signal system feasibility studies, signal system timing studies and implementation, project reports, environmental impact statements, and preparation of municipal agreements are other facets of work performed by the Unit. Urban Programs also has the responsibility for the selection of certain consultants, contract negotiation, and monitoring of consultants under contract to the Department of Transportation for traffic engineering matters that are the responsibility of the Traffic Engineering Branch.

The RAILWAY-HIGHWAY GRADE CROSSING SIGNALS UNIT coordinates the work of the Federal Highway Administration, the Division of Highways, various cities, and the railroads within the State, in connection with installation and maintenance of all railway-highway grade crossing signal and gate installations.

The FIELD OPERATIONS UNITS are staffed to the Assistant Manager of Traffic Engineering (Field Operations), and consist of a Raleigh Office FIELD SUPPORT UNIT, and five AREA TRAFFIC ENGINEERING UNITS with offices in: Wilson, Durham, Fayetteville, Winston-Salem and Asheville. The five Area Traffic Engineers supervise and coordinate the work of the Division Traffic Engineers located in each of the 14 operational Highway Divisions throughout the State (see map, page 9, Area Traffic Engineering Unit Area Assignments).

Each Area Traffic Engineer has an Assistant Area Traffic Engineer, an Area Accident Investigation Engineer, and a Division Traffic Engineer for each Division to handle the traffic problems in his area. His prime responsibility is to investigate and recommend improvements at locations on the State Highway system which are experiencing traffic operational and safety problems.

The FIELD SUPPORT UNIT serves as a liason between the field units and the Technical Operations units, other branches within the Division of Highways, various state and federal agencies and the public in general. This unit also provides technical and administrative assistance to the Assistant Manager of Traffic Engineering (Field Operations).

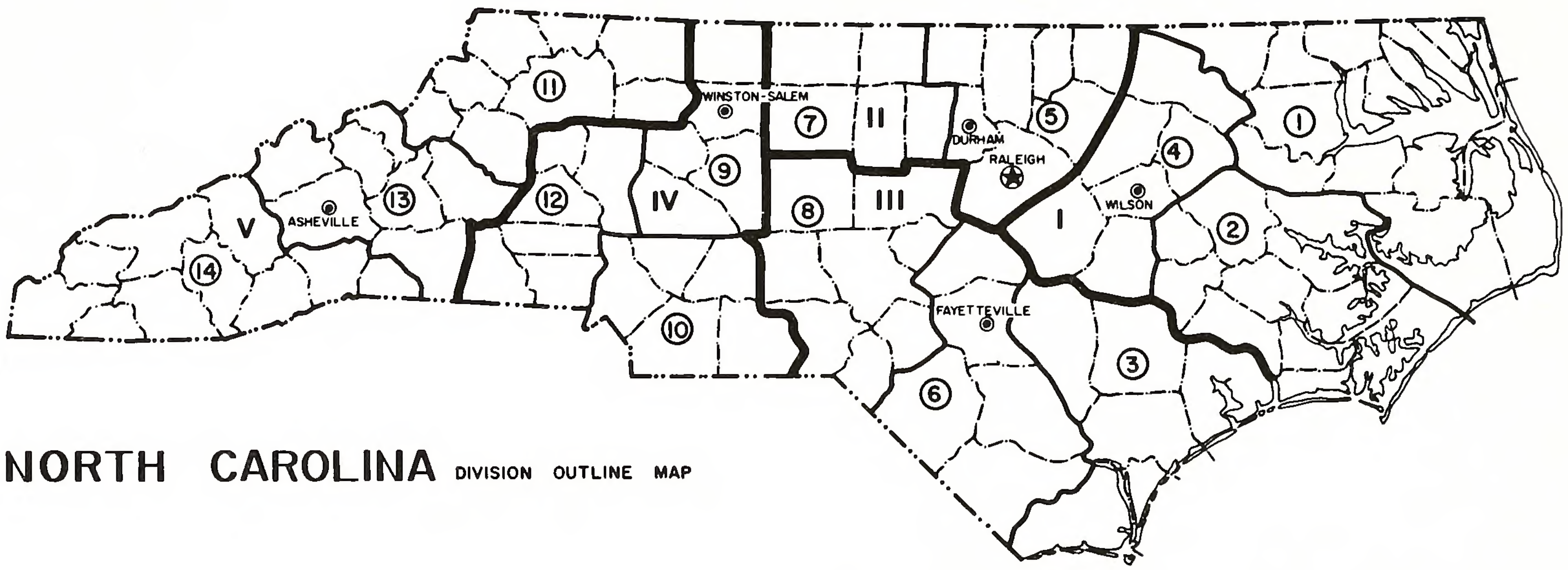


TRAFFIC ENGINEERING BRANCH
OPERATIONAL CHART

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

DECEMBER, 1975

AREA ASSIGNMENTS



NORTH CAROLINA DIVISION OUTLINE MAP

AREA	OFFICE	DIVISIONS
I	WILSON	1, 2, 4
II	DURHAM	5, 7
III	FAYETTEVILLE	3, 6, 8
IV	WINSTON-SALEM	9, 10, 12
V	ASHEVILLE	11, 13, 14

LEGEND

—·—·—	COUNTY LINE
─	DIVISION LINE
━	AREA LINE
◉	AREA OFFICE

ADMINISTRATION

ADMINISTRATION

As pointed out previously, the Branch is divided into three activity groups: Administration, Technical Operations, and Field Operations.

Administration, under the direction of the Manager of Traffic Engineering consists of the following sections:

1. Administrative Unit
2. Administrative Staff Unit

Both of these units are located in the Raleigh Office. They provide the necessary staff assistance to the Manager of Traffic Engineering in matters relating to the operation of the Branch as a whole, in both administrative and technical areas.

ADMINISTRATIVE UNIT

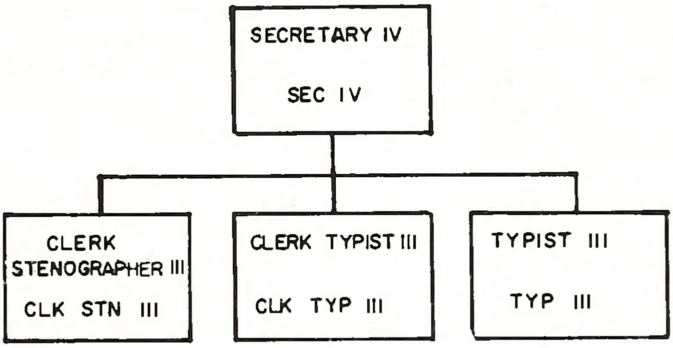
Purpose:

The Administrative Unit, in general, is responsible for all secretarial work for the entire Branch, maintaining personnel records, processing all purchase requisitions, keeping financial records, and maintaining equipment and supply inventories.

Personnel:

As indicated on the organizational chart for the Branch (Page 7), the Manager of Traffic Engineering directs the activities of the Administrative Unit which is composed of (1) Secretary IV, (1) Clerk-Stenographer III, (1) Typist III, and (1) Clerk-Typist III.

The Secretary IV supervises the Section.



ORGANIZATION CHART
ADMINISTRATIVE UNIT
12-31-75

Organization Changes:

During 1974, all steno and clerk positions were reclassified; although not effective until February 1975, the organization charts shown in this report reflect these reclassifications.

Activities and Accomplishments:

The Administrative Unit also serve as receptionists for the Branch, answering the telephone, with all calls for the entire staff coming through the central office.

In addition to the above, many letters and reports were typed each day for Branch personnel. The Traffic Engineering Branch 1974 Annual Report and Annual Highway Safety Listing publications were also typed by this unit.

The Historical Marker program for the State is handled by this Unit in conjunction with the Department of Archives and History.

Personnel files and records are maintained by the Secretary IV. She also keeps up with salary increment due dates for Branch employees, and sends in appropriate forms to grant these increments. She keeps up with positions that have been downgraded to be sure that people working in them are promoted or receive salary adjustments when they become eligible. She maintains a record of people eligible for promotion so that they can be considered for promotion when a vacancy occurs in a higher position classification.

All purchase requisitions are typed by the Secretary IV. A file of purchase requisitions and purchase orders is maintained and material received reports are sent to the Purchasing Department when materials ordered are received. A record of funds budgeted, funds expended, and balance remaining for the fiscal year is kept.

All requests for out-of-state travel and travel expense advances are processed by the Secretary IV. Employee's moving procedures, motor pool car requests, equipment rental cards, workmen's compensation forms, and time cards, are among some of the routine duties performed by the Administrative Unit.

The Branch's Administrative Files are maintained and office supplies are requisitioned from the Highway Building Supply Room by the Clerk-Typist III. She also acts as key operator for the Branch's duplicating machine and keeps an inventory of supplies and equipment and checks out equipment to Branch personnel.

The duties of the Administrative Unit may seem routine when compared to the other sections of the Branch. However, this small group is an extremely important part of the Branch. It is their accuracy and neatness of work that reflects on the efficiency of the Branch to the many people and other agencies that receive reports and correspondence from the Branch.

TECHNICAL OPERATIONS

TECHNICAL OPERATIONS

Technical Operations, under the direction of the Assistant Manager of Traffic Engineering (Technical Operations) consists of the following units:

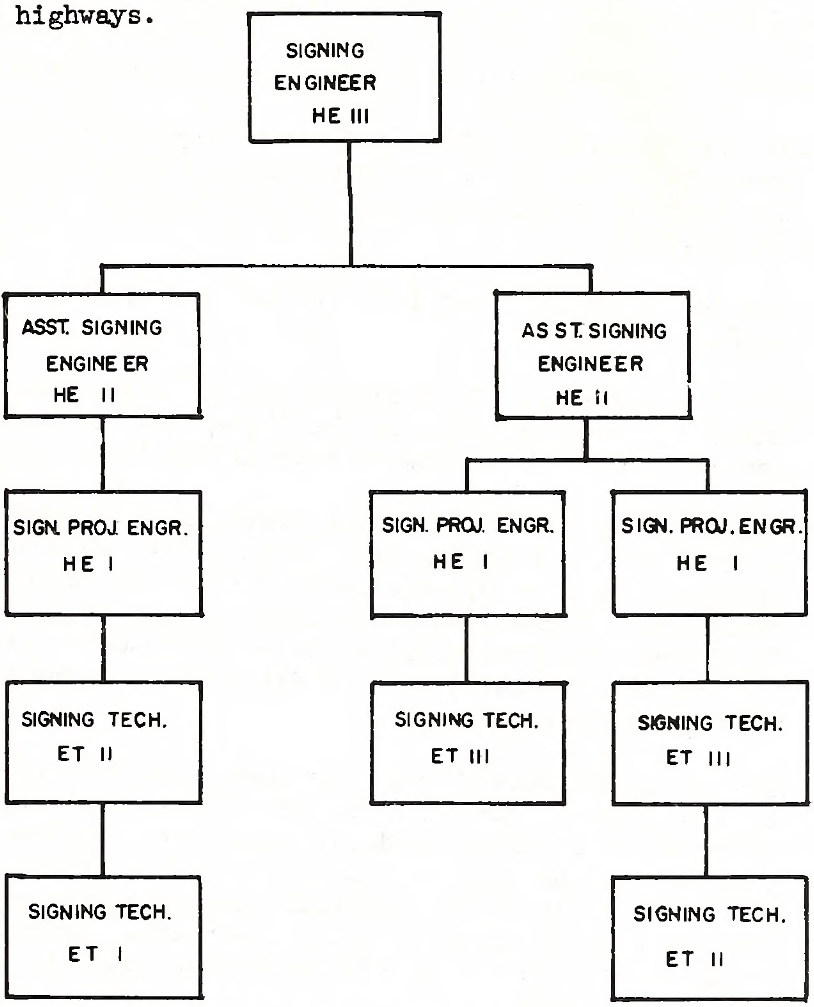
1. Signing
2. Signals and Geometrics
3. Accident Studies
4. Urban Programs
5. Special Projects
6. Railway-Highway Grade Crossing Signals

All of these units are located in the Raleigh Office. They provide the necessary designs and plans for traffic engineering improvements and other work necessary for the efficient performance of traffic engineering duties and responsibilities. A detailed description of each Technical Operations Unit and their accomplishments during 1975 follow under separate headings. Activities for each Unit of Technical Operations are enumerated for the years 1971-1975, where information is available. The activity charts show semi-annual quantities for January-June, and July-December of each year, as well as annual totals, where practical.

SIGNING

Purpose:

The Signing Unit is responsible for all necessary activities related to the design of all signing and sign lighting on State System streets and highways.



ORGANIZATION CHART
SIGNING UNIT
12-31-75

Personnel:

The Signing Unit includes a staff of 11 employees: 6 Highway Engineers, and 5 Engineering Technicians.

Organization Changes:

Reduction of 1 Highway Engineer II.

Activities and Accomplishments:

The design plans for signing North Carolina's major highways are developed in the Signing Unit. The Unit's responsibility does not end, however, when the plans are completed. They follow a project through construction; assisting field personnel with construction problems and conducting inspections of each project to ensure that the work is done according to plans and specifications. Considering projects in both the planning and construction stages, the unit was involved in over 56 highway signing projects this year.

The Unit's major activities for the year are outlined below:

....The preparation of signing plans and specifications for 32 projects with a total estimated cost of over $3,610,500. The cost of signing actually let to contract in 1975 was $3,392,000.

....The design of 39 electrical systems for lighting overhead signs.

....The processing of 673 requisitions for signs and signing materials requisitioned by the State's 14 Divisions. These materials came to a cost of over $1,274,000.

....The drafting of 59 full scale drawings of standard and special signs, bringing to a total of 946 such drawings on hand. Another 97 were revised to comply with current standards. These full scale drawings are available to the Divisions, the Prison Enterprises sign shop and to contractors to assist them in fabricating signs to the standard design.

....The review of catalog cuts for sign lighting equipment on 6 projects. Catalog cuts are the manufacturer's description of their product. The State requires that catalog cuts be provided for two reasons. First, they provide a check of the material the contractor plans to use prior to it actually being installed. Secondly, the catalog cuts provide an easy reference later if replacement parts are needed.

....The checking of the sign fabricator's layout details for 272 signs on 13 projects.

....The investigation for bridge-mounted signs on 2 projects, resulting in recommendations that no signs be mounted on bridges. Wherever overhead signs are required near an existing or proposed overpass, an investigation is made to determine if they can be mounted on the bridge rather than erect a separate sign structure.

As with most engineering work, signing and sign lighting design require a considerable amount of field work, both of a trouble shooting nature and final inspections. This is evidenced by the Unit's field work for 1975.

....14 Preconstruction Conferences
....61 Trouble Shooting Investigations
....14 Final Inspections
.... 3 Street Lighting Investigations

Throughout the year the Unit is called on for many special studies and activities related to signing and sign lighting. Two of these for 1975 were:

....A policy for standardization of signing at airports.

....The drafting of a new survey crew safety book.

SIGNING UNIT

ACTIVITY DESCRIPTION	1971		1972		1973		1974		1975	
1. Requisitions Received		500		556		614		629		673
2. Number Supports Designed for Requisitions		NA		NA		NA		23		54
3. Full-Scale Drawings Completed		150		80		175		136		59
4. Full-Scale Sign Drawings Revised or Redrawn		NA		NA		160		143		97
5. Miscellaneous Cost Estimates		15		NA		NA		19		16
6. "Sign Attachment to Bridge" Investigations		8		5		11		9		2
7. Contract Field Inspections		NA		NA		NA		14		35
8. Contract Pre-Construction Conferences		6		9		14		14		14
9. Routine or Trouble-Shooting Contract Field Trips		NA		NA		48		65		61
10. Contract Final Inspections		9		14		33		24		14
11. Sign Projects Completed		19		25		12		10		32
12. Sign Projects Incomplete		NA		NA		NA		22		24
13. Stop Sign Ordinance Deletions	180 133	313	97 45	142	64 57	121	120 83	203	82 24	106

SIGNING UNIT

ACTIVITY DESCRIPTION	1971	1972	1973	1974	1975
14. Signs Sized and Layout Made	NA	NA	NA	430	1096
15. Number Steel Supports Designed	NA	NA	NA	838	1652
16. Number of Overhead Sign Supports Designed	NA	NA	NA	22	37
17. Number of Overhead Sign Lighting Systems Designed	NA	NA	38	14	39
18. Projects for which Catalog Cuts Approved	NA	16	14	6	6
19. Sign Fabricators Layouts Checked	NA	NA	300	207	272
20. Signs Designed and Fabrication Drawings Made	57	226	539	520	385

SIGNALS & GEOMETRICS

Purpose:

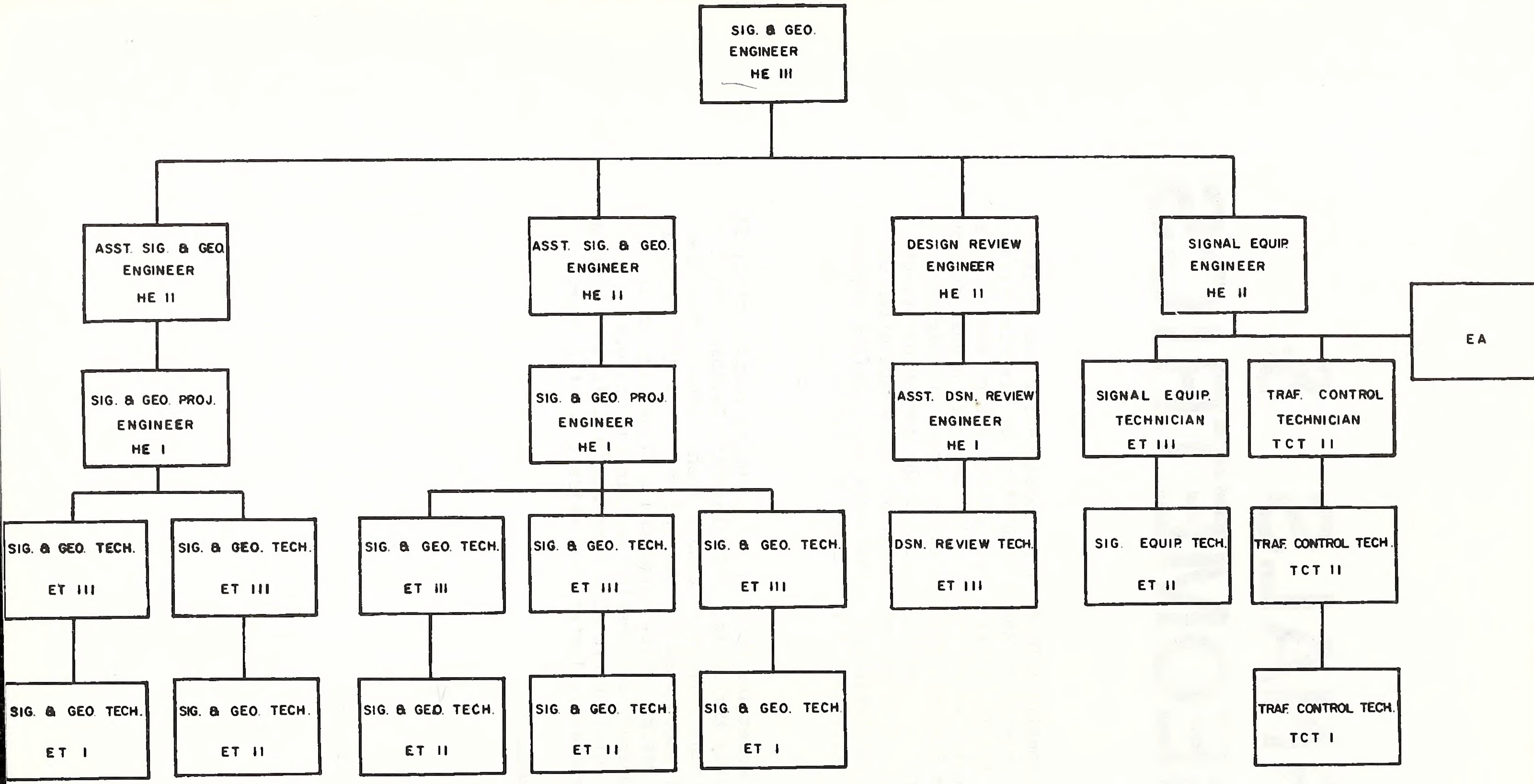
The Signals and Geometrics Unit is responsible for the entire spectrum of work related to the installation of traffic signal systems and also traffic engineering related design work. This includes the preparation of intersection designs, signal designs, and signal system designs; the review of street and highway construction plans for traffic problems; the review of street and driveway entrance permit applications; the preparation of traffic signal specifications; maintenance of a traffic signal inventory; and traffic signal repair and maintenance.

Personnel:

The Signals and Geometrics Unit has a personnel complement of 25 employees: 8 Highway Engineers, 13 Engineering Technicians, 1 Engineering Aide, and 3 Traffic Control Technicians. They are divided into four functional groups: Two Signals and Geometrics Design Squads, a Design Review Squad and a Signal Equipment Squad. Three temporary engineering technicians and one temporary clerk positions are also currently utilized. During 1975 the unit operated full staff the majority of the year.

Organization Changes:

None.


SIG. & GEO. ENGINEER HE III
ASST. SIG. & GEO. ENGINEER HE II
SIG. & GEO. PROJ. ENGINEER HE I
SIG. & GEO. TECH. ET III
SIG. & GEO. TECH. ET I
SIG. & GEO. TECH. ET III
SIG. & GEO. TECH. ET II
ASST. SIG. & GEO. ENGINEER HE II
SIG. & GEO. PROJ. ENGINEER HE I
SIG. & GEO. TECH. ET III
SIG. & GEO. TECH. ET II
SIG. & GEO. TECH. ET III
SIG. & GEO. TECH. ET II
SIG. & GEO. TECH. ET III
SIG. & GEO. TECH. ET I
DESIGN REVIEW ENGINEER HE II
ASST. DSN. REVIEW ENGINEER HE I
DSN. REVIEW TECH. ET III
SIGNAL EQUIP. ENGINEER HE II
EA
SIGNAL EQUIP. TECHNICIAN ET III
SIG. EQUIP. TECH. ET II
TRAF. CONTROL TECHNICIAN TCT II
TRAF. CONTROL TECH. TCT II
TRAF. CONTROL TECH. TCT I

ORGANIZATION CHART
SIGNALS AND GEOMETRICS
UNIT

SIGNALS AND GEOMETRICS DESIGN SQUADS

Activities and Accomplishments

The Signals and Geometrics Squads are responsible for the preparation of traffic signal and intersection geometric designs. This begins with a field stadia survey by the squad or a base map prepared by the Location Unit. The base maps show existing pavement edge, driveways, drainage facilities, utility poles....etc.

After a review and analysis of information and recommendations from the Area Traffic Engineers, preparation of the design proceeds. Proposed widening, channelization, pavement markings and detail dimensions are placed on the final design. If traffic signals are involved, the signal suspension arrangement, traffic detectors, poles, signal phasing, color sequence charts and other signal data are placed on the design.

In cooperation with the Urban Programs Unit and the Signal Equipment Squad, time was spent by the design squads in the review of both preliminary and final draft specifications for complex computerized signal control systems for a number of cities. The construction of the systems for Charlotte, Greensboro, Lincolnton, Taylorsville, and Newton has been completed this year. The Winston-Salem system is under construction and the bid awarded for the Salisbury system. High Point and Durham systems will be let soon. In the signal design stages are the cities of Reisdville, Eden, Madison, Mayodan, Elon College, Mebane, Lumberton and Asheboro.

Quite a few of the designs prepared now are part of the Highway Safety Program, and constructed with moneys set up under the Federal Highway Safety Act.

Some regular work is also for signals on roadway construction projects. This often requires coordination with other Branches and Units of the Department of Transportation or the Federal Highway Administration to obtain information pertinent to completing projects, (Right-of-Way, Utilities, Roadway Design, Planning, Location and Photogrammetry).

To complete contract signal plans, both city and Federal Highway Administration approval on final designs are required. Engineers estimates, Special Provisions and the submission of the PS&E package to Roadway Design is required before the project can be let to contract.

Other activities also include the following: reviewing and commenting on preliminary and final plans and specifications furnished by consultants for contract projects, reviewing specifications and contract special provisions for signal systems in urban areas, attend field inspections on contract signal projects, and perform onsight inspections for special problems when necessary.

SIGNAL EQUIPMENT SQUAD

Activities and Accomplishments

The Squad reviewed and assisted with the development, preliminary design and completion of the following systems, either pending, under construction and completed this year in North Carolina: Rocky Mount, Wilmington, Winston-Salem, Charlotte, Greensboro, Asheboro, Lincolnton, Taylorsville, Newton, Salisbury, Durham, Havelock, Lumberton, Reidsville and High Point.

Many numerous smaller isolated systems and intersections were installed and improved with this Squad's assistance.

The Squad's responsibilities are as follows:

1. Assisting the Signal and Geometric Design Squads with equipment required for signal designs.
2. Repairing and maintaining traffic signal equipment.
3. Participation in all urban programs projects.
4. Maintaining the traffic signal inventory which includes continued updating to reflect new installations and revisions of existing signal installations.
5. Maintaining the file of signal designs.
6. Preparing Engineers Estimates on Signal construction projects.
7. Performing preliminary and final inspections on all signal systems.
8. Assisting the Division Traffic Control Technicians in the installation of signal equipment.
9. Testing and evaluating signal equipment.
10. Designing and fabricating special equipment.
11. Preparing the Traffic Signal Specifications for all signal equipment in use, and being sure that manufacturers comply with the requirements of the Traffic Signal Specifications.
12. Preparation of the 2 year Bid Contract for signal equipment. Coordinating the State's requirements for Traffic Signal equipment estimated at $500,000.00 annually.
13. Coordinating with Equipment Depot in keeping an inventory of sufficient equipment for installation and maintenance.

DESIGN REVIEW SQUAD

Activities and Accomplishments

The Design Review Squad reviews roadway and driveway plans for elements of safety, capacity and overall traffic operations. When revisions in the plans are recommended, they coordinate the recommendations with all other agencies involved.

The Design Review Group is primarily concerned with the Safety elements of geometrics on proposed roads and on existing roads that are being improved. Sight distance, superelevations, curvature, number of lanes, roadway widths - all these and more are studies with safety to the motoring public in mind.

The efficiency and safety of a street or highway depends largely upon the amount and character of any interference with vehicles moving along the roadway. The major interference normally encountered is that of vehicles leaving, or crossing the road or standing nearby. In order to protect the traveling public and to fully utilize the potential of the highway investment, it is necessary to regulate the vehicle movements into and out of roadside developments - thus aiding in reducing the interference with the traffic stream. Driveway traffic accounts for a large percentage of the interruptions to smooth traffic flow.

In light of the above, the Signals and Geometrics Unit has personnel concerned with the special review of driveway connections into the State Highway System. They review design elements of location, spacing, sight distance, throat width, radii, angles, deceleration lanes, and grades. These elements greatly influence the operating characteristics and level of service on adjacent highway facilities.

This group also works with the Roadway Design Unit when special problems arise during the design stages of roadway projects. A summary of major accomplishments by the Design Review Group during 1975 is as follows:

88 sets of plans for highway construction were reviewed with recommendations going to the Roadway Design Unit. This requires 7 field investigations.

359 Special Commercial Driveway Permits were reviewed with the Highway Design Branch, Planning and Research Branch and the Area and Division Traffic Engineers. The recommendations of these branches were combined and submitted to the Division Engineer for his approval.

1072 Regular Commercial Driveway Permits were reviewed for compliance with the "Manual on Driveway Entrance Regulations".

84 Field investigations were made by this group to accomplish the above reviews.

All TOPICS reports submitted were reviewed and recommendations were made to the Urban Programs Unit.

The Squad organized and instructed a driveway workshop for N.C. Division Southern Section Institute of Traffic Engineers. Two squad members instructed at a Capacity Workshop for Traffic Engineers from State, County and City agencies.

SIGNALS AND GEOMETRICS UNIT

ACTIVITY DESCRIPTION	1971		1972		1973		1974		1975	
1. Signal (Only) Designs		286		370		380	98 126	224	195 176	371
2. Geometrics (Only) Designs		154		96		122	49 42	91	36 46	82
3. Geometrics and Signal Designs		NA		45		71	36 27	63	37 27	64
4. Stadia Surveys		190		178		171	85 78	163	90 97	187
5. Consultant Plans and Specifications Reviewed		191		108		185	82 83	165		103
6. Review of Purchase and Scratch Requisitions		NA		201		624	325 328	653	287 526	813
7. Locations Coded for Inventory		NA		604		418	336 336	672		26
8. TOPICS Meetings Attended		NA		NA		25		17		21
9. TOPICS Reports Reviewed		NA		NA		5	1 1	2		4
10. Preconstruction Conference Attended		NA		NA		5	1 1	2		3
11. Regular Driveway Permit Reviews		1350		1829		1410	615 563	1178	525 547	1072
12. Special Driveway Permit Reviews		390		524		509	222 219	441	189 170	359
13. Highway Construction Plans Reviewed	69 99	168	108 76	184	45 36	81		80	41 47	88

SIGNALS AND GEOMETRICS UNIT

ACTIVITY DESCRIPTION	1971		1972		1973		1974		1975	
14. Driveway Permit Field Investigations		NA		NA		NA		105		84
15. Pieces of Signal Equipment Repaired		803		922		1024	549 717	1266	829 817	1646
16. Special Projects*		26		24		31	12 12	24		23

* Test and special application equipment built and assistance in equipment installation.

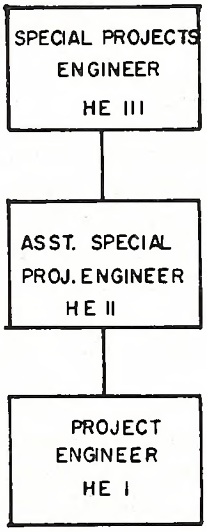
SPECIAL PROJECTS

Purpose:

The primary function of the Special Projects Unit is to carry out special engineering and administrative projects and duties.

Personnel:

The Special Projects Unit is staffed directly to the Assistant Manager of Traffic Engineering (Technical Operations) and consists of the Special Project Engineer, the Assistant Special Project Engineer, and a Project Engineer.


SPECIAL PROJECTS ENGINEER HE III
ASST. SPECIAL PROJ. ENGINEER HE II
PROJECT ENGINEER HE I

ORGANIZATION CHART
SPECIAL PROJECTS UNIT
12-31-75

Organization Changes:

None.

Unit Functions:

The Special Project Unit carries out the following functions for the Traffic Engineering Branch:

1. Conducts product testing and evaluation of traffic control and traffic safety devices, materials and new traffic engineering methods for evaluation and possible use on the State Highway Systems.

2. Conducts special engineering projects assigned by the Assistant Manager of Traffic Engineering (Technical Operations).

3. Prepares branch technical manuals and other branch publications.

4. Prepares Traffic Engineering policy publications and maintains them up to date for guidance of the branch's personnel for use in the efficient daily operation of the branch.

5. Performs adminstrative duties as follows:
    a. Furniture and equipment requisitions
    b. Furniture and equipment inventory supervision
    c. Records retention schedule
    d. Office layout planning
    e. Annual Report
    f. Traffic Engineering Library supervision
    g. Annual Traffic Services Meeting Coordination
    h. Office facilities coordination
    i. Personnel safety planning and coordination
    k. Supervise branch forms control system
    l. Supervise distribution of branch technical publications
    m. Supervise branch trainee program

Activities and Accomplishments:

The Special Projects Unit performs a variety of engineering and administrative studies, investigations, and reports. Normally these projects fall into one of the following categories: Traffic Control Devices Evaluation, Training, Technical Manuals, Policy Manuals, and Administrative projects.

During 1975 the Special Projects Unit was involved in the following projects and activities:

1. Coordinated the preparation of project reports for 115 locations included in the North Carolina Highway Safety Improvement Program (Fiscal 1975 & 1976) for Federal Aid participation under Sections 209, 210 and 230.

2. Preparation of plans, special provisions, and location listings for the contract installation of thermoplastic pavement markings at all paved railroad-highway grade crossings in the State under Section 205 of the Federal-Aid Highway Safety Act.

3. Published a traffic signal brochure for use as a public relations tool for field traffic engineers explaining Department of Transportation policies concerning the installation of traffic signals on the State Highway System.

4. Conducted field evaluation tests on reflective sign sheeting materials and pavement marking materials.

5. Published Traffic Engineering Branch Annual Report.

6. Coordinated the Annual Traffic Services Meeting.

7. Prepared the Traffic Engineering Branch material to be included in the N. C. Administrative Code.

8. Published a report on Sand Ramp Truck Crash Attenuators.

9. Prepared plans for office space requirements for the branch for relocation to new office facilities.

10. Conducted the following federal-aid projects with grants from the Governor's Highway Safety Program:
    a. Low Profile Pavement Marking Evaluation
    b. Automatic Ice on Bridge Sign System
    c. N.C. Construction and Maintenance Operation Supplement to the MUTCD Revision and Printing Project
    d. Manual on Street and Driveway Entrance Regulations

ACCIDENT STUDIES

Purpose:

The primary purposes of the Accident Studies Unit consists of the following:

(1) To identify hazardous locations in North Carolina through computer analysis of traffic accident data.

(2) To select from among these hazardous locations those which have the greatest potential for accident reductions. Two techniques involved are (a) the determination of definite accident patterns upon which to base effective improvements, and, (b) the application of investment return analysis to test the effectiveness of the improvements.

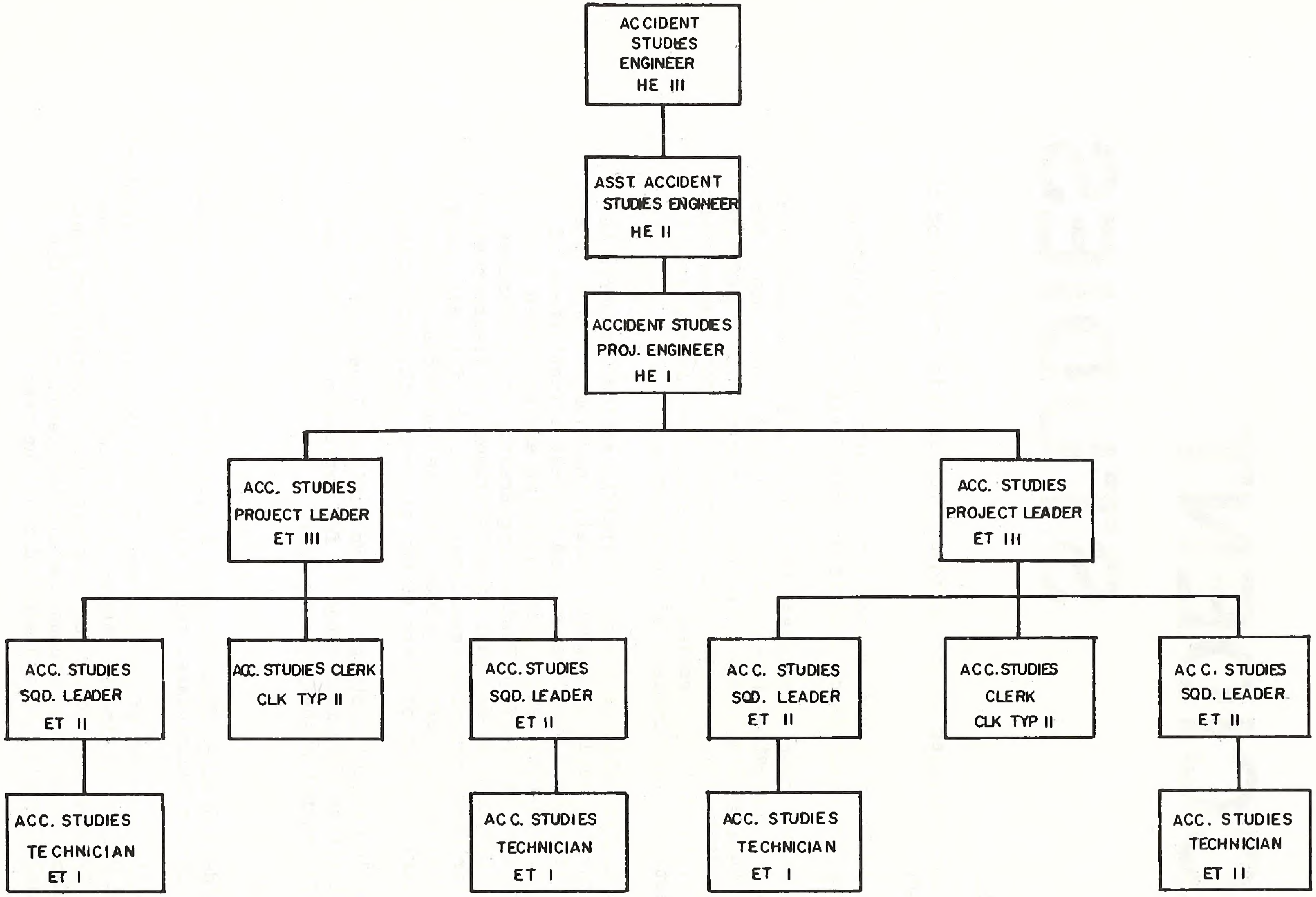
(3) To analyze all, or groups of traffic accident records to determine needs in highway safety improvements both on and off the State Road system, and to test effectiveness of installed treatments. These studies are performed for Units of the Traffic Engineering Branch, other branches of the Division of Highways, the Department of Transportation, other State agencies, municipal and count officials, news media, public service groups, private individuals, and others from out of State as may request such information.

(4) Develop annual listings of high accident locations and prioritize them into projects for improvements under the 1973 Federal Highway Safety Act.

Personnel:

The Accident Studies Unit contains 15 positions: 3 Highway Engineers, 10 Engineering Technicians, and 2 Clerk-Typists.

The Unit is composed of the Accident Studies Engineer, the Assistant Accident Studies Engineer, the Accident Studies Project Engineer, 2 Clerk-Typists and two Project Leaders who supervise two squads each. Each of the four squads contain two technicians. One additional clerk typist was added during the year.


ACCIDENT STUDIES ENGINEER HE III
ASST. ACCIDENT STUDIES ENGINEER HE II
ACCIDENT STUDIES PROJ. ENGINEER HE I
ACC. STUDIES PROJECT LEADER ET III
ACC. STUDIES PROJECT LEADER ET III
ACC. STUDIES SQD. LEADER ET II
ACC. STUDIES CLERK CLK TYP II
ACC. STUDIES SQD. LEADER ET II
ACC. STUDIES SQD. LEADER ET II
ACC. STUDIES CLERK CLK TYP II
ACC. STUDIES SQD. LEADER ET II
ACC. STUDIES TECHNICIAN ET I
ACC. STUDIES TECHNICIAN ET I
ACC. STUDIES TECHNICIAN ET I
ACC. STUDIES TECHNICIAN ET II

ORGANIZATION CHART

ACCIDENT STUDIES UNIT

12-31-75

Organization Changes:

The Accident Studies Unit was renamed from the Traffic Studies Unit. This new name properly reflects the true duties and responsibilities of this unit. The newly added Clerk Typist II was moved from the Administrative Unit to the Accident Studies Unit as a result of changing work loads within the two Units. This position is assigned to work under one of the Accident Studies Project Leaders.

Activities and Accomplishments:

(1) The "1975 Highway Safety Program Listing" was completed and published. The program contains 398 urban and rural locations ranked in priority order based on a combination rating of exposure, number of accidents and accident severity. This list includes 362 intersections, 29 concentrations and sections, and 7 bridges.

(2) The Unit completed 1494 routine and special requests for accident data. 410 of these requests were for collision diagrams, 99 were for Before and After Studies and 11 were for other traffic accident studies.

(3) A list of locations to be improved under the 1973 Federal Highway Safety Act for the fiscal year 1975-76 was completed and published. There were 505 locations for which accident data was collected and priority order was calculated using Benefit-Cost Analysis and other methods calculating benefits from improvements. Section 203 (Railroad-Highway Crossing) included 166 railroad crossings, Section 209 (High Hazard) Locations) included 102 locations, Section 210 (Elimination of Roadside Obstacles) included 19 locations, and Section 230 (Safer Roads Demonstration Program) included 218 locations.

(4) A lecture was prepared and presented at a Highway Patrol Basic Training School during the year by Unit personnel.

(5) A comprehensive manual was prepared and printed by the Unit during the year. The title is "Manual for Traffic Accident Analysis" and all technicians within the unit received instructions based on the manual during the year.

(6) Field inventories of fixed object hazards on eight different sections of roadway were conducted by Unit personnel. These inventories were used to develop projects and cost estimates for major improvement projects included in Section 210 of the 1973 Highway Safety Act Listings.

(7) Two members of the Unit developed and presented lectures at an Institute of Traffic Engineers Workshop on Highway Safety which was attended by traffic engineering technicians throughout the State.

(8) Traffic accidents were screened during the year looking for bridges with traffic accidents occurring on ice. A listing of 13 bridges was developed and was used to select two sites for installation of ice detectors.

(9) A member of the Unit attended a one week workshop on Benefit-Cost Analysis during the year and also attended a conference on Accident Analysis sponsored by Penn. State University.

ACCIDENT STUDIES UNIT

ACTIVITY DESCRIPTION	1971		1972		1973		1974		1975	
1. Collision Diagrams Prepared	306 234	540	152 213	365	79 218	297	257 273	530	159 251	410
2. Before and After Studies Prepared	321 276	597	330 81	411	52 12	53	17 15	32	75 24	99
3. Rates Calculated for Tentative Safety Program Listing		0		0	354 434	788	66 325	391	425 309	734
4. Other Accident Studies Prepared	208 287	495	323 468	791	460 317	777	568 381	949	438 536	974
5. Production Rates: Accidents Plotted Per Man Day Worked		NA		8.6	9.0 12.5	10.5	16.8 17.2	17.0	15.9 18.3	17.1
6. Special Projects Prepared	15 10	25	14 7	21	4 0	4	1 3	4	5 6	11

Notes:

(2) The reduction in Before and After Studies completed in 1973 and 1974 may be explained by the fact that in July of 1972 the Accident Studies Unit was reorganized. The "Before and After" section was divided into four squads. Before and After studies now are done after other more important work is completed.

(3) Rates for Safety Program Locations were not calculated separately from the collision diagrams prepared for them until the 1973 Safety Program.

(5) Production Rate factors were not calculated on a montly basis until October, 1972. The Production Rate is a method of equating different types of work produced to accidents plotted on a collision diagram per man day worked.

RAILWAY-HIGHWAY GRADE CROSSING SIGNALS UNIT

Purpose:

The purposes of the Railway-Highway Grade Crossing Signals Unit are as follows:

1. To coordinate the work of the Federal Highway Administration, the Division of Highways, some of the cities, and the various railroads in the programming, design and other preliminary work in connection with the installation or modification of railway-highway grade crossing protective devices.

2. To supervise the installation of railway-highway grade crossing signals and gates,to make final inspections of such installations and to pay final bills from the railroads for the work of installation.

3. To oversee the maintenance of existing highway-railway grade crossing signal installations and to handle payment of the State's share of the cost of such maintenance.

Personnel:

The Railway-Highway Grade Crossing Signal Unit consists of the Railway-Highway Grade Crossing Signal Engineer and the Assistant Railway-Highway Grade Crossing Signal Engineer.

Organization Changes:

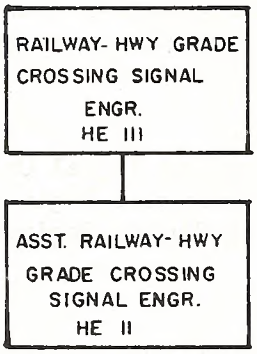
This is a new unit within the Traffic Engineering Branch. It was transferred to the Branch in July, 1975, from the Bridge Design Unit.

Activities and Accomplishments:

Late in 1973 the Board of Transportation approved a list of approximately 70 locations, both on and off the State System, for installation of railway-highway grade crossing protective devices. During the year 1975 work on this program began. The projects were set up and all necessary surveys made by DOT survey personnel. These surveys were reviewed by Area Traffic Engineers and personnel of this section. They were then transmitted to the Railroads with outlines of what was to be installed.

These Federal-Aid projects were in addition to the projects installed with State funds or installed in connection with highway construction projects which relocated or widened existing highways or which created new grade crossings.

As of January 30, 1976, 12 Federal-Aid projects have been completed and 25 have been approved by the Federal Highway Administration for installation. The remaining projects in the Federal Program are all well in process and it is believed all of the 70 should be authorized for construction by July 1. Many of those already authorized should be completed by that date.


RAILWAY- HWY GRADE CROSSING SIGNAL ENGR. HE III
ASST. RAILWAY- HWY GRADE CROSSING SIGNAL ENGR. HE II

RAILWAY - HIGHWAY
GRADE CROSSING SIGNAL UNIT

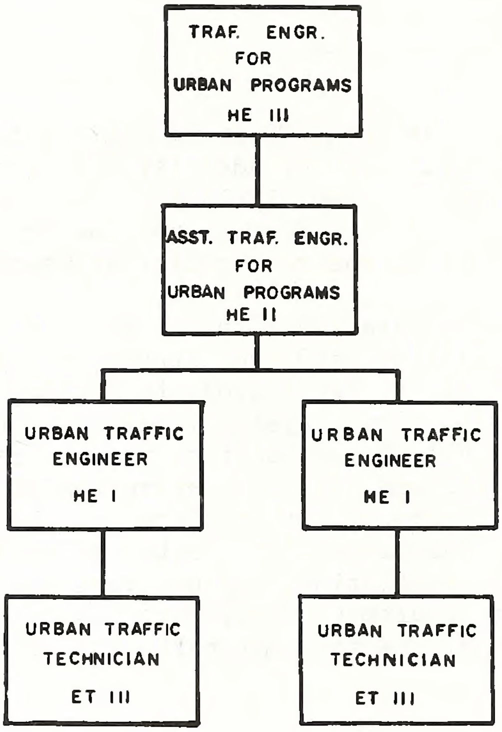
2-15-76

URBAN PROGRAMS

Purpose:

The primary purpose of the Urban Programs Unit is to coordinate the efforts of the Federal Highway Administration, the Division of Highways, and the various municipalities in the State, in the identification, preliminary design, and construction of TOPICS type improvements in the most efficient manner possible.

This Unit, working in cooperation with the Signals and Geometrics Unit, various municipalities, and consultants, provides assistance to the Construction Unit for those projects dealing with sophisticated traffic signal control. Signal system feasibility studies, signal system timing studies and implementation, project reports, environmental impact statements, and preparation of municipal agreements are other facets of work performed by the Unit. Urban Programs also has the responsibility for the selection of certain consultants, contract negotiation, and monitoring of consultants under contract to the Department of Transportation for traffic engineering matters that are the responsibility of the Traffic Engineering Branch.



TRAF. ENGR. FOR URBAN PROGRAMS HE III
ASST. TRAF. ENGR. FOR URBAN PROGRAMS HE II
URBAN TRAFFIC ENGINEER HE I
URBAN TRAFFIC ENGINEER HE I
URBAN TRAFFIC TECHNICIAN ET III
URBAN TRAFFIC TECHNICIAN ET III

ORGANIZATION CHART
URBAN PROGRAMS UNIT

Personnel:

The Urban Programs Unit consists of the Traffic Engineer for Urban Programs, the Assistant Traffic Engineer for Urban Programs, two Urban Traffic Engineers, and two Urban Traffic Technicians.

Organization Changes:

None.

Activities and Accomplishments:

The year 1975 was a year of varied and interesting work for the Urban Programs Unit and a year that saw the completion of several important projects.

The Final TOPICS Study Report for Lenoir was received from the consultant and subsequently reviewed and approved.

In 1975 the CBD signal systems for Raleigh, Greensboro, and Charlotte were completed. During the construction of these projects Urban Programs Unit personnel were advisors to the Construction Unit and played an important role in the testing and acceptance of these signal systems. Urban Programs Unit personnel wrote project reports and municipal agreements for signal systems in Winston-Salem, Asheboro and Salisbury and assisted in the preparation of the plans and bid documents for these three projects. The Winston-Salem, Salisbury and Rocky Mount signal systems were let to contract in 1975 and Urban Programs Unit personnel will act as advisors to the Construction Unit on these projects. A pre-bid conference for the Winston-Salem Signal System was conducted by the Urban Programs Unit. In addition, Unit personnel wrote draft municipal agreements for the maintenance of the Raleigh, Greensboro, and Charlotte signal systems and for the leasing of telephone lines for the Raleigh signal system.

A combined Project Report and Environmental Impact Statement was written for a two-intersection project in Charlotte and Environmental Impact Statements were written for the Asheboro and Salisbury signal system projects. Also summary reports were written for a pedestrian overpass project in Wilmington and a four-intersection improvement project in Reidsville.

The pedestrian bridge in Wilmington, the intersection improvements in Reidsville, and a project for improvements to a portion of Bragg Boulevard in Fayetteville were let to contract in 1975.

Urban Programs Unit personnel continued work on the development of the plans, specifications and complete bid packages for the High Point and Durham computerized signal systems. These are now high priority projects and are scheduled for letting in 1976.

Evaluation reports were completed for the North Boulevard improvements and the Hillsborough-Edenton Connector improvements in Raleigh and for the Independence Boulevard-Stonewall Street intersection improvements in Charlotte. Before-and-After evaluation studies were begun for the Asheboro and Salisbury signal systems and for the Bragg Boulevard Corridor improvements in Fayetteville.

Urban Programs Unit personnel did a comprehensive study of parking on a portion of the Hillsborough Street Corridor in Raleigh and the recommendations in this study were implemented during 1975. Also, a draft report was completed by Unit personnel on the Hickory CBD signal system.

Urban Programs Unit personnel served as instructors in a Intersection Capacity Workshop on Evaluating Traffic Operations Improvement Programs. Also, unit personnel attended and assisted in the presentation of a seminar on the Washington D.C. UTCS signal system.

In addition to the above, unit personnel attended numerous routine meetings and conferences, handled routine correspondence and continued the processing of invoices for payment.

URBAN PROGRAMS UNIT

ACTIVITY DESCRIPTION	1971	1972	1973	1974	1975
1. TOPICS Studies Completed	2	5	2	6	1
2. Preliminary TOPICS Studies Monitored and Reviewed	6	2	6	7	2
3. Municipal Agreements Written	6	12	1	1	8
4. Project Reports Completed	19	15	3	1	3
5. Preliminary Project Reports Written	19	15	5	0	0
6. Environmental Impact Statements Written	10	17	13	3	3
7. Summary Reports Written	0	0	10	2	2
8. Signal System Projects Completed	0	0	1	2	3
9. TOPICS Projects Let To Contract	6	8	15	0	4
10. Monitored Development of Preliminary Plans and Specs.	1	1	1	4	3
11. Field Plan Inspections	0	15	18	10	11
12. Final Inspections	0	0	12	14	6
13. Annual Work Program Improvements Started	114	114	117	117	0

URBAN PROGRAMS UNIT

ACTIVITY DESCRIPTION	1971	1972	1973	1974	1975
14. Annual Work Program Improvements Completed	0	50	102	117	0
15. Public Hearings Attended	4	4	1	0	0
16. TOPICS Projects Completed	2	8	7	2	0
17. Signal System Plans & Specs. and Complete Bid Package	0	3	5	1	3
18. Evaluation of TOPICS Projects	0	0	5	6	6

FIELD OPERATIONS

FIELD OPERATIONS

Field Operations is under the direction of the Assistant Manager of Traffic Engineering (Field Operations). It consists of five Area Traffic Engineering Units, with offices located statewide, and a Field Support Unit, located in the Raleigh Office.

The function of Field Operations is to provide traffic engineering services throughout the State. In accomplishing the duties of Field Operations, the staff is in constant contact with public officials, businessmen, citizens, and Division personnel. As a result, they are in an excellent position to promote good public relations and an understanding of Division of Highways' objectives on the local level.

Activities of each Field Operations Unit are enumerated for the years 1971-1975, where information is available. The activity charts show semi-annual quantities for January-June and July-December of each year, as well as annual totals, where practical.

FIELD SUPPORT

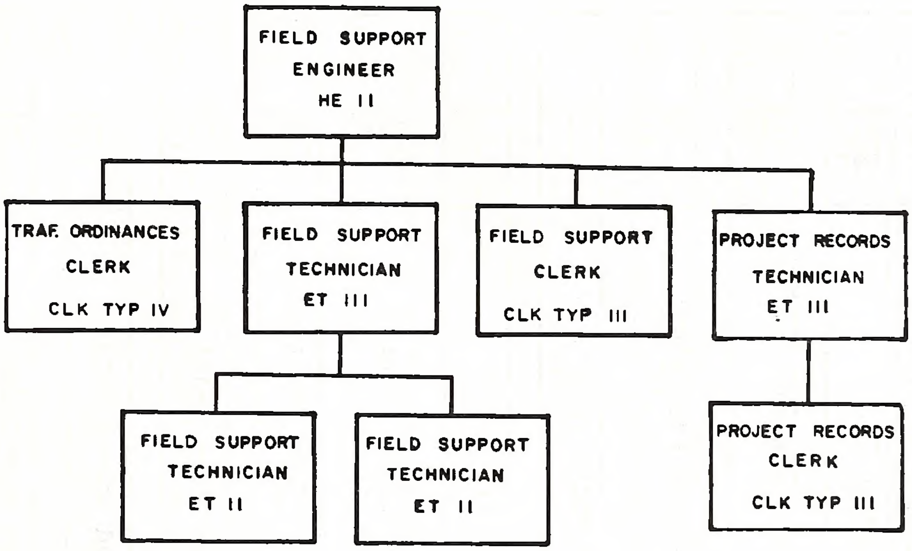
FIELD SUPPORT SECTION:

Purpose:

The Field Support Unit serves as an administrative staff to the Assistant Manager of Traffic Engineering (Field Operations). The primary responsibility of this unit is to assist field operations personnel by: setting up and maintaining central files of various types of traffic related requests from various sources; processing their requests for information and materials; processing and maintaining records of traffic ordinances and channelization fund work orders; and providing service on miscellaneous requests.

Personnel:

The Field Support Section consists of 1 Field Support Engineer, 1 Field Support Clerk, 3 Field Support Technicians, 1 Traffic Ordinances Clerk, 1 Project Records Technician and 1 Project Records Clerk.


FIELD SUPPORT ENGINEER HE II
TRAF. ORDINANCES CLERK CLK TYP IV
FIELD SUPPORT TECHNICIAN ET III
FIELD SUPPORT CLERK CLK TYP III
PROJECT RECORDS TECHNICIAN ET III
FIELD SUPPORT TECHNICIAN ET II
FIELD SUPPORT TECHNICIAN ET II
PROJECT RECORDS CLERK CLK TYP III

ORGANIZATION CHART
FIELD SUPPORT UNIT

FIELD SUPPORT UNIT

ACTIVITY DESCRIPTION	1971			1972			1973			1974			1975		
1. Requests Logged In	928	863	1791	874	407	1281	442	409	851	388	406	794.	344	581	925
2. Accident Data Requested	76	31	107	66	220	286	324	332	656	326	286	612	300	325	625
3. Traffic Volumes Requested	15	17	32	92	114	206	152	142	294	156	142	298	143	154	297
4. Time Lapse Photography										5	1	6	2	4	6
5. Work Orders Processed			NA	NA	179	179	124	178	302	113	139	252	238	320	558
6. Entries in Safety Program	399	0	399	243	1924	2167	1187	1340	2527	855	1125	1980	911	1234	2145
7. Munic. Speed Zone Addition	178	200	378	234	166	400	317	200	517	143	206	349	387	158	545
8. Munic. Speed Zone Delete.	153	140	293	137	144	281	243	123	366	68	101	168	115	56	171
9. Rural Speed Zone Addition	253	160	413	239	224	463	230	201	431	1106	1038	2144	415	368	783
10.Rural Speed Zone Delete.	186	100	286	192	169	361	169	143	312	166	330	496	152	300	452
11.No Parking Ord. Addition	80	90	170	88	84	172	61	79	140	56	104	160	108	83	191
12.No Parking Ord. Delete	1	0	1	5	4	9	6	11	17	13	9	22	3	1	4
13.Stop Sign Ord. Addition	853	611	1464	749	882	1631	605	545	1150	529	946	1475	647	818	1465

FIELD SUPPORT UNIT

ACTIVITY DESCRIPTION	1971		1972		1973		1974		1975	
14. Yield Sign Ordinance Additions	31 11	42	13 24	37	25 16	41	5 19	24	14 18	32
15. Yield Sign Ordinance Deletions	5 7	12	6 10	16	7 11	18	4 11	15	7 14	21
16. U.S. Route Changes Additions and Deletions	4 6	10	15 13	28	3 7	10	0 9	9	4 3	7
17. N.C. Route Change Additions	7 3	10	6 8	14	1 2	3	1 9	10	5 5	10
18. N.C. - U.S. Route Changes Additions	2 1	3	0 0	0	1 2	3	1 0	1		0
19. Temporary Speed Zone Ordinance Additions	17 10	27	9 5	14	3 3	6	1 5	6	4 2	4
20. One-Way Road or Street Ordinance Additions	1 2	3	1 0	1	0 0	0	1 0	1	2 0	2
21. Truck Route Ordinance Additions		2		1		0		4	3 1	4
22. Right-Turn-On-Red Ordinance Additions*		-		-		-	- 1551	1551	45 15	57
23. Right-Turn-On-Red Ordinance Deletions*		-		-		-	- 16	16	23 0	23

* Enacted July 1, 1974

AREA TRAFFIC ENGINEERING

Purpose:

The Area Traffic Engineering Units are responsible for the investigation, implementation of improvements on the Safety Program, the investigation and processing of all requests and complaints regarding traffic problems on state system highways, the carrying out of policies and procedures of the Division of Highways and providing traffic engineering services on a statewide basis through the administration of five Area Traffic Engineering Offices and fourteen Division Traffic Engineering Offices.

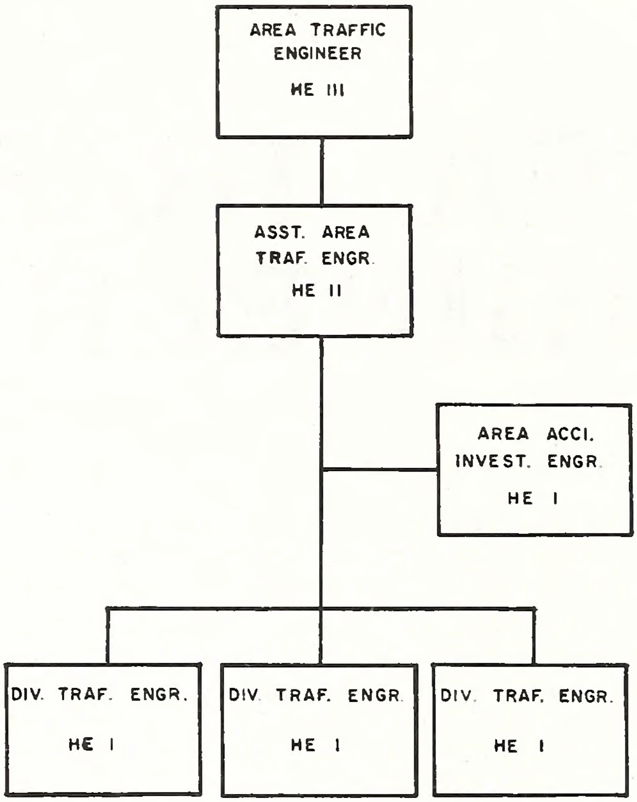
Personnel:

The Area Traffic Engineering Units are located in five field engineering offices, each of which is headed by an Area Traffic Engineer, who has under his supervision an Assistant Area Traffic Engineer, an Area Accident Investigation Engineer, and two to three Division Traffic Engineers (one for each Division within his area). This makes a total of 29 Highway Engineers located throughout the State to carry out the field operations of the Traffic Engineering Branch.

Each Area Traffic Engineer is responsible for the Branch's field operations in approximately one-fifth of the State. He and his staff are located in an Area Traffic Engineering Office with the exception of the 14 Division Traffic Engineers, who are located in respective Division Offices.

Organization Changes:

None.



ORGANIZATION CHART
AREA TRAFFIC ENGINEERING
UNIT (TYPICAL)

Activities and Accomplishments:

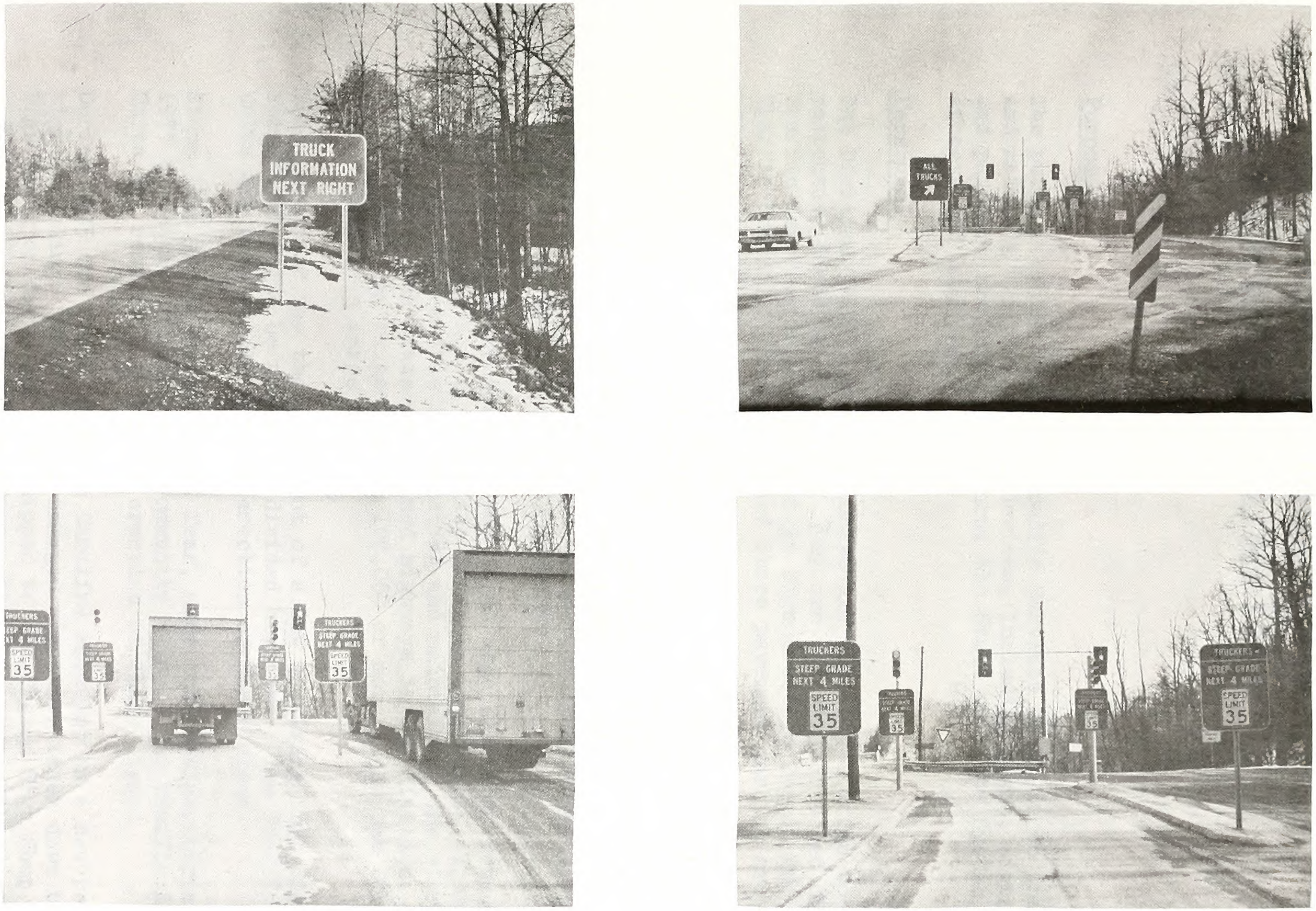
As a result of the collapse of the bridge over the Yadkin River at Siloam, the Department of Transportation embarked on an extensive project to upgrade the safety of all narrow and one lane bridges in the State and to replace those where needed to prevent a similar occurrence. This required much time and effort on the part of our field engineers. They inspected 4935 bridges to determine what traffic control devices needed to be added or replaced. The types of improvements recommended ranged from warning signs and guardrail to bridge failure detection systems and signalization.

AREA TRAFFIC ENGINEERING UNITS

ACTIVITY DESCRIPTION	AREA I		AREA II		AREA III		AREA IV		AREA V	
1. Urban Speed Zones	25 21	46	31 16	47	15 9	24	11 7	18	4 3	7
2. Rural Speed Zones	34 33	67	44 39	83	30 22	52	33 81	114	48 66	114
3. School investigations (cross-walks, speed zones, etc.)	16 8	24	6 8	14	2 6	8	12 18	30	4 17	21
4. Intersection Studies	31 37	68	26 28	54	11 9	20	44 38	82	13 13	26
5. Regulatory Sign Invest.	52 42	94	58 28	86	3 3	6	32 21	53	34 44	78
6. Guide Sign Investigation	21 26	47	32 43	75	25 35	60	27 39	66	29 41	70
7. Warning Sign Invest.	18 22	40	41 34	75	28 20	48	49 40	89	43 28	66
8. Plans Reviews	11 8	19	7 7	14	7 6	13	23 28	51	9 7	16
9. Crossover Investigations	14 9	23	3 3	6	4 5	9	11 17	28	0 1	1
10. Route Changes	1 3	4	2 3	5	5 3	8	1 0	1	4 3	7
11. Hazardous Locations Non Safety Program	10 2	12	1 15	16	10 15	25	39 42	81	41 51	92
12. Commercial Driveways	49 26	75	33 22	55	15 19	34	47 37	84	2 4	6
13. Rural Safety Program Invest.	9 8	17	16 10	26	8 5	13	31 16	47	11 15	26

AREA TRAFFIC ENGINEERING UNITS

ACTIVITY DESCRIPTION	AREA I			AREA II			AREA III			AREA IV			AREA V		
14. Urban Safety Program Inventory	12	13	25	38	41	79	54	4	9	27	42	69	10	11	21
15. R/R Crossing Studies	14	5	19	4	0	4	20	15	35	17	16	33	5	7	12
16. Encroachment Contracts	3	1	4	6	1	7	0	0	0	4	1	5			0
17. Traffic Signal Investigations	41	46	87	37	45	82	60	84	144	58	85	143	31	32	63
18. Pavement Markings Invest.	10	16	26	7	6	13	15	25	40	12	22	34	23	26	49
19. Other Field Invest.	8	18	26	47	55	102	30	46	76	111	124	235	51	68	119
20. Bicentennial Signing	1	5	6	0	1	1	0	2	2	0	3	3	0	0	0
21. Bridge Failure Devices			0	0	6	6	0	8	8	0	43	43	0	46	46
22. Narrow Bridge Study	0	256	256	0	902	902	0	275	275	0	1401	1401	0	2101	2101



Photographs depict truck information station at top of Old Fort Mountain in McDowell County. Truckers are required to pull into the station to read signs warning of a steep four-mile downgrade ahead. A traffic signal was installed at the station to make sure the truckers stop and take time to read the messages. After sufficient time has elapsed, the trucker gets a green indication and can then proceed on down the mountain, well aware of the potentially dangerous steep downgrade

DIVISION TRAFFIC SERVICES UNITS

Purpose:

The purpose of the Division Traffic Services Units is to install and maintain traffic control devices, including signs, signals and pavement markings, throughout the State on State System streets and highways.

Personnel:

The Division Traffic Services Units are directly staffed to their respective Division Engineer. They are normally composed of: a Traffic Services Supervisor, eight Sign Erection Crews, two Traffic Control Technicians, and three pavement marking crews totaling to 18 men.

Activities and Accomplishments:

During the past year the Division Traffic Services Units continued to install, place, and maintain the traffic control devices on state roads. These traffic control devices are divided into three categories: signs, signals, and markings.

Signs: Each Division normally has eight sign erection crews, under the direction of a Traffic Services Supervisor. These crews are responsible for erecting and maintaining the signs along the State maintained highways in the division. As there may be as many as 100,000 or more signs per Division, this is a large task.

This past year saw the enactment of a law requiring that Slower Traffic Keep Right signs be posted on divided highways. The Traffic Services Units are responsible for the erection of these signs.

Since 1976 is our Bicentennial Year, many communities started in late 1975 to request Bicentennial Community signs. The Traffic Services Units are responsible for the erection of these signs.

During 1975 the State of North Carolina embarked on a new program of sign recycling. Worn out and damaged signs are taken down by the Sign Erection Crews and are shipped to the Prison Sign Shop. Here, with the aid of some new machinery, they are straightened, stripped and reused. This process is saving the State a substantial amount of money.

Signals: The signals on State maintained highways are the responsibility of the two Traffic Control Technicians in each division. After receiving the plans for a signal installation prepared by the Traffic Engineering Branch, these technicians, with the help of others in the Traffic Services Unit, install the signals. The installation includes the erection of poles and spanwire, and also the electrical wiring involved with the signal. After installation, these technicians maintain the signal, which includes lamp replacement and replacement of damaged heads or damaged wiring. It is not uncommon to see a Traffic Control Technician out repairing a damaged signal at any hour of the day or night.

Markings: The Division Traffic Services Units paint the centerlines and edgelines on nearly 50,000 miles of paved roadways in the State. This is a year round job though most of the painting is done in the spring and summer. The units placed over a million gallons of paint on State system roadways in 1975.

The Traffic Services Units have continued to mark roads under the Section 205, Pavement Marking Demonstration Program, during the past year. This program is nearly completed now and represents a job well done by Traffic Services.

Another new service that these units are providing is the marking of some public airport runways. This involves some types of markings that are different from the normal highway painting, but they have been able to do it successfully.

The pavement marking programs have been hampered this past year by rising costs of materials, and a reduced budget. However, the pavement marking program was maintained in an excellent manner.

Another project in which the Traffic Services Units have played a major part is the narrow bridge study that is currently underway. North Carolina is putting forth a major effort to increase the safety of narrow bridges across the State. The Traffic Services Units have been putting down pavement markings and erecting signs, signals, and delineators for this program.

The Division Traffic Services Supervisors not only oversee the functions of their units, but also order the materials and supplies that are needed for the Unit's activities. During the first part of each year the Traffic Services Supervisors and their assistants meet with the Traffic Engineering Branch in Raleigh to discuss problems, policies, objectives, and plans for the coming year.

PROFESSIONAL ACTIVITIES

By encouraging its personnel to participate in professional activities and to work toward professional and educational advancement, the Traffic Engineering Branch hopes to cultivate individual professionalism and thereby augment the potential of the organization.

Among the professional organizations to which Traffic Engineer Branch personnel belonged in 1975, the Institute of Traffic Engineers could claim the greatest number -- 24 in the national organization, 26 in the Southern Section, and 63 in the North Carolina Division.

There are sixteen registered Professional Engineers within the branch and four Certified Engineering Technicians.

Traffic Engineering Branch personnel served on the following national committees in 1975 dealing with traffic engineering subjects:

1. ITE Committee 5-2 which involves internal circulation and parking at shopping centers.

2. Transportation Research Board Committee A3D05 - Maintenance of Traffic Control Devices.

3. Transportation Research Board Committee A2G02 - Coatings, Signing and Marking Materials.

4. Transportation Research Board Committee A3A02 - Traffic Control Devices.

5. National Advisory Committee on Uniform Traffic Control Devices - Traffic Signal Sub-Committee.

6. ITE Committee 5-EE-Bikeways.

7. ITE Group Insurance Advisory Committee.

8. ITE Technical Council, Committee on Review of NEMA Traffic Signal System Standards.

Traffic Engineering Branch personnel participated in the following training activities in 1975 in order to maintain or improve their professional standing and effectiveness in the field of Traffic Engineering.

Traffic Engineering Branch

1975 Training Activities

Training Activity	Participants
Annual Traffic Services Supervisors Meeting, 1975	30
DOT Trainees on OJT, 12-Week Program	18
Supervisory Management Course II	10
Conference Leaders Training Course for Supervisory Management	3
Urban Traffic Control Systems Seminar	12
Traffic Safety Short Course	7
Traffic Signal Applications Workshop	2
Highway Capacity Workshop	7

In addition, Traffic Engineering Branch personnel participated in the following regional and national technical meetings and conferences of a professional nature:

National Advisory Committee on Uniform Traffic Control Devices

FHWA Region Four Highway Safety Standard Program Meeting

Summer Meeting of the National Advisory Committee on Uniform Traffic Control Devices

American Association of State Highway Officials Summer Meeting of the Subcommittee on Traffic Engineering

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